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Supplemental Material

Methods to Estimate Acclimatization to the Urban Heat Island Effects on Heat- and Cold-Related Mortality

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Figure S1. The Wald z values for a range of candidate cutpoints defining hot and cold days (approach (i)). The values used in our analyses (6.4 and 22.3°C) are those with maximum z values.

Figure S2. Schematic illustrating how to estimate expected Interaction Rate Ratio (IRR) for heat. The same model as the main model was fit except: excluding an interaction term of temperature and UHI anomalies; and temperature effect modelled as a linear spline (segmented linear model) with knots at the minimum mortality temperature (18.6°C) and the higher cut-point (22.3°C). Expected IRR for heat is estimated as the slope in the spline above the highest knot.

Figure S3. Theoretical patterns of heat-mortality functions in 'Shifted splines' analysis under *no* acclimatization [A], where the curves for UHI anomalies (UHIa) of +0.5 ˚C (dashed line) and -0.5 ˚C (dotted line) are laterally displaced by +0.5 ˚C and -0.5 ˚C respectively from the London overall curve; and *full* acclimatization [B], where there is no displacement of curves for UHIa of +0.5 ˚C and -0.5 ˚C, which are therefore superimposed.

Figure S4. Temperature-mortality functions assuming acclimatization is neutral (γ=0.5) between full (γ=0) and none (γ=1) (left) and deviances of lateral displacement for values of γ in the range -0.5 to 1.5 ˚C (right) for summer heat (lags 0 to 1 days, June to August) [A] and winter cold (lags 0 to 13 days, September to May) [B], for those aged 75+ years only. Gray shading in the temperature mortality functions represent 95% CI. Deviances were calculated against maximum likelihood estimate (MLE). Likelihood ratio test (LRT) was applied for differences between deviances at γ =1 and γ =0.

Figure S5. Temperature-mortality functions assuming acclimatization is neutral (γ=0.5) between full (γ=0) and none (γ=1) (left) and deviances of lateral displacement for values of γ in the range -0.5 to 1.5 ˚C (right) for summer heat (lags 0 to 1 days, June to August) [A] and winter cold (lags 0 to 13 days, September to May) [B], after adjusted for O_3 and PM_{10}. Gray shading in the temperature mortality functions represent 95% CI. Deviances were calculated against maximum likelihood estimate (MLE). Likelihood ratio test (LRT) was applied for differences between deviances at γ =1 and γ =0.